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# Do Juvenile Curfew Laws Reduce Underage Drinking?

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## Abstract

### Objective:

Although not originally enacted to deter the problem of underage drinking in the United States, one set of laws that may influence this behavior is juvenile curfew laws. This research asked the following: (a) What is the effect of enacting a juvenile curfew law on youth drinking, and (b) do demographic variables moderate the relation between juvenile curfew law enactment and drinking? This study examined the effect of juvenile curfew laws on underage drinking, using data from 46 U.S. cities from 1991 to 2005.

## Method:

In 2014, we compiled a data set containing alcohol and curfew law data by zip code. It included 63,081 minors (ages 12–17 years) from 1,081 zip codes. We used difference-in-difference regressions to analyze the data.

## Results:

The effect of the enactment of a curfew law on the likelihood of consuming alcohol in the past year or past 30 days or of heavy episodic drinking in the past 2 weeks was not significant when compared with cities without curfew laws during the same periods. Although the likelihood of consuming alcohol over the past year differed depending on an individual's characteristics (e.g., race/ethnicity, age, and gender), none of the interaction terms between these characteristics and curfew laws were significant.

## Conclusions:

Curfew laws appear to have a non-significant effect on youth drinking, but these results are unclear without more knowledge as to where and when youth are drinking both before and after the enactment of curfew laws and how these laws are being enforced.

Juvenile curfew laws influence a range of adolescent behaviors and resulting negative outcomes, including traffic injuries/fatalities, pediatric emergency department transports, and prevalence of juvenile trauma ([Levy, 1988](#); [Preusser et al., 1990, 1993](#); [Shatz et al., 1999](#); [Weiss et al., 1998](#)). This article examines whether juvenile curfew laws reduce another harmful adolescent behavior: underage drinking.

Juvenile curfew laws seek to provide general protection to youth and adults by restricting the times that children of certain ages are allowed to occupy public places or streets. They often contain exceptions, such as allowing youth to be accompanied by adults. If youth are unable to be in public places at night, perhaps they may also drink less because of reduced access to alcohol.

This article combines data from the federal Monitoring the Future (MTF) Survey with information previously collected on the prevalence of youth curfew laws across the 50 states to answer two questions: (a) What is the effect of enacting a juvenile curfew law on youth drinking, and (b) Do demographic variables (e.g., race/ethnicity, gender, age, average grades, or number of parents in the household) moderate the relation between juvenile curfew law enactment and drinking?

## Underage drinking in the United States

There are currently at least 8.7 million underage drinkers in the United States ([Center for Behavioral Health Statistics and Quality, 2015](#)). As of 2015, more 8th, 10th, and 12th graders had tried alcohol than had tried cigarettes or any illicit drug ([Johnston et al., 2016b](#)). Whereas adolescents drink less often than adults, when they drink they consume more alcohol per sitting than adults. Youth ages 12–20 years who drink alcohol report consuming an average of five drinks per occasion about 6 times a month, compared with adult drinkers age 26 years and older, who report only consuming an average of two to three drinks per occasion about 9 times a month ([Office of the Surgeon General, 2007](#)).

Youth drinking patterns differ depending on gender and race/ethnicity. For example, males consume slightly less alcohol than females in 8th grade, although this has reversed by 12th grade ([Johnston et al., 2016a](#)). African American youth tend to drink less frequently and engage in heavy episodic drinking less often than White or Hispanic youth ([Johnston et al., 2016a](#)). Among 8th graders, Hispanic youth drink and engage in heavy episodic drinking more often than White youth. This trend is reversed among 12th graders.

Youth drinking may also be moderated by average grades or the number of parents in their household. Research shows that high grades predicted increased family social support, which was associated with decreased alcohol

consumption ([Mason & Windle, 2001](#)). Perhaps youth with higher grades are more likely to follow the rules, and therefore, their drinking will be differently affected by the enactment of a curfew law than students with lower grades. In addition, having more parents living in the household may lead to increased family social support and therefore a greater likelihood that youth obey curfew laws and thus drink less after the enactment of a curfew law than youth with fewer parents living in the household.

Each year, about 4,300 people under age 21 years die from alcohol-related injuries involving underage drinking, such as those that result from motor vehicle crashes, homicides, and suicides (Centers for Disease Control and Prevention, n.d.). Underage drinking also increases the risk of sexual and physical assault or of acquiring a sexually transmitted disease, physically alters adolescents' developing brains, and results in poor academic performance ([Corbin & Fromme, 2002](#); [Grunbaum et al., 2004](#); [Hingson et al., 2005](#); [White & Swartzwelder, 2005](#)). Underage drinking is a risk factor for heavy episodic drinking and alcohol dependence as an adult ([Hawkins et al., 1997](#)). The most recent study found that underage alcohol consumption cost the United States \$24.3 billion in 2010 ([Sacks et al., 2015](#)).

## Juvenile curfew laws in the United States

Cities generally enact juvenile curfew laws in response to increased juvenile crime or victimization. Omaha, NE, enacted the first juvenile curfew law in 1880, and by 1900 more than 3,000 U.S. jurisdictions had enacted them ([Hemmens & Bennett, 1999](#)). Around World War II, rising juvenile delinquency rates and the postwar population boom resulted in increased juvenile curfew enactment and enforcement. By 1957, more than half of the 109 cities with populations greater than 100,000 had juvenile curfews.

The American Civil Liberties Union and others began to challenge cities' juvenile curfew laws, leading many cities to repeal or just stop enforcing them ([Kline, 2012](#)). This changed in 1991 when Dallas, TX, enacted a new curfew ordinance that was upheld by the U.S. Court of Appeals for the Fifth Circuit and therefore became a model for many American cities. By 2009, 84% of cities with populations greater than 180,000 had enacted youth curfews, and two U.S. presidents had endorsed these laws—Presidents Harrison and Clinton ([Editors, 1958](#); [Favro, 2009](#); [Montgomery County Office of Public Information, n.d.](#); [Wildermuth, 1996](#)).

This study examined the effect of juvenile curfew laws on underage drinking using data from 46 U.S. cities from 1991 through 2005.

## Method

### Data

Data on alcohol consumption came from MTF, a nationally representative repeat cross-sectional survey of 8th, 10th, and 12th graders. It surveys about 50,000 students each year, with high response rates (86%–91% for 8th and 10th graders and 80%–84% for 12th graders). The current study only uses data from when the survey first included 8th and 10th graders (1991 forward). [Kline \(2012\)](#) provides the data on juvenile curfew laws. His rigorous process produced reliable data on 65 major cities (defined by him as those with 1990 populations greater than 180,000): 54 cities with curfew laws and 11 without such laws as of 2005. Of the 54 cities with curfew laws, 35 had enacted these laws after 1992 and were included in this study. The rest were excluded, as they enacted their curfew laws before 1992. Ninety-seven percent of those 35 cities enacted those laws between 1992 and 1996 ([Table 1](#)). In the end, this study used data for 46 cities, 35 with juvenile curfew laws and 11 without. Given the nature of the data, the University of Maryland, Baltimore County Institutional Review Board exempted the research from human subjects review.



[Table 1](#)

Statistics on when cities enacted curfew laws

Merging the two data sets required identifying all zip codes in the relevant cities, as the MTF data are sorted by zip code. We then mapped the zip codes overlaid by the city borders to determine visually how much of a zip code was geographically within the city border. Next, we removed individuals in zip codes overlapping city borders or those who had not answered the questions on alcohol consumption. The final MTF data set included 63,081 individuals from 1,081 zip codes in the 46 study cities. Although the sample contained an almost equal number of females and males surveyed, the race/ethnicity, age, and locations of the individuals were not as equally distributed ([Table 2](#)).



[Table 2.](#)

Demographics of overall sample

## Analysis

We conducted a difference-in-difference regression analysis of all the data from the 46 study cities for the 15-year period, using the following three outcome variables: (a) annual drinking, (b) monthly drinking, and (c) heavy episodic drinking (defined by MTF as five or more drinks in a row during the past 2 weeks). The possible answers were multiple choice and nonlinear, so we converted the variables into three dichotomous variables. We assigned a “0” for people who had not consumed alcohol in the past year or past month or for those who had not engaged in heavy episodic drinking in the past 2 weeks and a “1” to everyone who had engaged in these behaviors.

The main predictor variable—entitled *curfew* in this article—was the difference-in-difference interaction between cities that had implemented curfew laws by a given year during the study period and cities that had not. This made it possible to look at the difference in alcohol consumption in youth between two groups of cities: those having implemented a curfew by a given year and those that had not. Rather than multiplying the two main effects to create an interaction term, the interaction term was manually created. Curfew equaled 1 if an individual surveyed lived in a city with a curfew in a year after the curfew in that city was enacted; otherwise, it equaled 0. For example, if a city enacted a curfew in 1995, then curfew equaled 0 for each year from 1991 to 1994 and 1 for each year from 1995 to 2005. We provided Stata code (StataCorp LP, College Station, TX) to an analyst at the institution where the MTF data reside, and he used the Stata analyses code “*xtreg*” and the variable “Curfew” as the interaction term. The coefficient reported for curfew is the change in outcome contemporaneous to treatment, over and above the changes for others who do not switch into treatment.

There were nine other predictor variables. The first three were characteristics of the cities or the curfew laws and included the statutory curfew age, a city variable, and a time variable. The six remaining MTF-provided predictor variables were characteristics of the individual youth and included race/ethnicity (separated into two dummy variables for Black and Hispanic), gender, age, the number of parents or guardians living in the household, and the youth’s average letter grades.

We considered several other variables for inclusion in the models, such as population in 1990 and 2000; youth younger than 18 years of age in 2000; unemployment rates in 2000; median income in 2000; pregnancy rates in 2000; variables measuring eighth grade reading, writing, or math test scores in 2000; and variables measuring juvenile crime in 1999 or 2000. Because there was no variation in these variables over the 15 years of survey data, they were ultimately omitted from the fixed-effects model.

We ran several difference-in-difference regression models. All of the models included people who were under the statutory curfew age and who lived in zip codes that were 100% within the city boundaries. The first set was fixed-effect models run without any interaction terms and then again with an interaction term for gender, age, race/ethnicity (with dummy variables for Black and for Hispanic), average grades (for students who earned A’s compared with any other letter grade or just C’s/D’s), or number of parents in the household. The second set of models ran each of the models in the first set but included 14 different dummy variables for each year, which accounted for drinking trends that varied in any particular year. The third set of models ran each of the models in

the first set but included interaction terms for each city by year, which accounted for drinking trends that varied in each city in any particular year. All of the models were clustered by city.

## Results

### Effects of enacting juvenile curfew laws on three underage alcohol consumption variables

Overall rates of alcohol consumption—in cities with and without curfew laws—were consistent with past research. For example, a large percentage of those surveyed did not consume alcohol in the last year (42%) or the last 30 days (66%) or did not engage in heavy episodic drinking in the last 2 weeks (82%).

We found that having enacted a curfew law had no significant impact on whether an individual under the statutory curfew age consumed alcohol in the past year in these unadjusted models ([Table 3](#)). In contrast, we found that the likelihood of consuming alcohol over the last 30 days or of engaging in heavy episodic drinking over the last 2 weeks increased slightly (6.3 and 4.6 percentage points, respectively) after a curfew law was enacted compared with cities that had never enacted one over the same periods,  $t = -2.53, p < .022, F(15, 16) = 301.3, Prob > F = .001, N = 10,656; t = -2.42, p < .028, F(15, 16) = 3,290.6, Prob > F = .001, N = 10,532$ . When regressions were run again with 14 different individual dummy variables for each year, the models were not significant and there was no significant effect of enacting curfew laws on any of the three variables measuring underage alcohol consumption. When we included interaction terms for each city by year in these models, the increase in the number of variables without an increase in the sample size prevented any of the models from being significant.

 [Table 3](#).

#### [Table 3](#).

Regressions for people under the statutory curfew age who lived in zip codes that were 100% within the city boundaries with no interaction terms between curfews and gender, age, or race/ethnicity

Several of the city–year interactions were also dropped from the model for collinearity. These two sets of regressions addressed unmeasured trends over time, such as the underlying trend in youth drinking.

### Effect of gender, age, race/ethnicity, average grades, or number of parents in the household on underage alcohol consumption

We found no differences in the rates of underage alcohol consumption by race/ethnicity or gender from prior research in cities with or without curfew laws. For example, males and White individuals in this study consumed more alcohol and engaged in heavy episodic drinking more often than females or Hispanic or Black individuals.

After we controlled for other variables, the likelihood of consuming alcohol over the past year,  $F(15, 16) = 274.3, Prob > F = .001, N = 10,671$ , the likelihood of consuming alcohol over the past 30 days,  $F(15, 16) = 301.3, Prob > F = .001, N = 10,656$ , and the likelihood of engaging in heavy episodic drinking in the past 2 weeks,  $F(15, 16) = 3,290.6, Prob > F = .001, N = 10,532$ , differed depending on an individual's race/ethnicity, age, gender, average grades, and number of parents living in the household ([Table 3](#)). For example, as each year of age increased, a person was more likely to have engaged in these behaviors. However, when we ran regressions including an interaction term between the curfew variable and gender, age, race/ethnicity (with dummy variables for Black and Hispanic), average grades, or number of parents in the household, none of the interaction terms was significant, although all of the regression models including these interaction terms were.

## Discussion

Although many factors were related to a youth's likelihood of consuming alcohol, simply enacting a curfew law did not seem to have an effect. None of the regressions showed a negative relation between enacting a curfew

law and any of three variables used to measure underage alcohol consumption. In fact, two of the regressions even showed the reverse; however, this effect disappeared when dummy variables for each year were added to the model. After an in-depth analysis of the data and an examination of trends and interactions between each city and each year (versus just overall), it became apparent that enacting a curfew law did not affect youth drinking. In addition, although race/ethnicity, gender, age, grades, and the number of parents in the household all individually affect youth drinking, they did not moderate the relation between curfew enactment and youth drinking.

There is little literature on the subject of underage drinking and curfew laws, but there is reason to believe that these were cities with high rates of crime and underage alcohol consumption before enacting the curfew laws. Even after enacting these laws, youth drinking in some cities continued to increase. One possible explanation for this finding is that enacting a curfew law did not increase underage alcohol consumption, but rather, the cities that chose to enact curfew laws did so because they already were having problems and were looking for solutions. This theory is supported by the fact that when trends for any given city over time were taken into consideration, any effects disappeared.

There is also a big difference between enacting a juvenile curfew law and enforcing it. Unfortunately, no easily accessible variables were available to determine the enforcement levels in any particular city. This may have affected the results, because not enforcing a curfew law is tantamount to not having one. Moreover, the majority of the cities with curfew law changes studied here (97%) enacted their curfews between 1992 and 1996. However, the data used in this study ranged from 1991 to 2005. This has two implications. First, in most cities, the time span we used for investigating the effects of curfew laws on underage alcohol consumption was a minimum of 9 and a maximum of 13 years after the city had enacted the curfew. Even if a city had initially enforced a curfew law, it is possible and perhaps likely that enforcement waned over time. Second, many cities included had little pre-intervention data, which might have made it hard to detect trends before enactment of the law. Future studies looking at the effect of curfew laws on youth drinking only in the first year or two after their enactment and with more pre-intervention data would be interesting and might find different results. However, a question would still remain about the effectiveness of the laws over the long term.

There is also a difference between “consumption” and “harm”; therefore, it is possible that the curfew laws may not influence underage consumption but could still reduce negative consequences of youth drinking. For example, [Paschall et al. \(2014\)](#) found that a stronger social host policy did not reduce past-year alcohol use or heavy drinking in general among past-year drinkers but was inversely related to drinking at parties. [Holder et al. \(2000\)](#) found decreases in the number of nighttime injury crashes (10%), the number of crashes in which the driver had been drinking (6%), and the number of assault injuries observed in emergency departments (43%) in three California communities with environmental interventions compared with three comparison cities.

It is also possible that curfew laws have no effect on underage alcohol consumption because youth do not always go into public places to purchase or consume alcohol. Data from the National Survey on Drug Use and Health conducted in 2012 (SAMHSA, 2013) found that the majority of underage drinkers reported last consuming alcohol in either their own home (31.4%) or someone else's (54.4%). The majority of teenagers also see alcohol as readily available ([Johnston et al., 2013](#)). Therefore, although curfew laws may reduce traffic injuries and fatalities, they may not reduce underage alcohol consumption because youth continue to drink the same amount or more while at a home instead of in a public place. Given that a curfew law may decrease where youth consume alcohol but not how much they consume, it might be more likely to find effects of a curfew law on assaults/fights or driving under the influence of alcohol than on consumption per se.

## Limitations

This study does have limitations. First, the alcohol consumption data were self-reported. Bias may have occurred, as there is no way to assess the reliability of the answers provided. It is reasonable to assume that this self-reporting bias was consistent over time, so it should not have affected the trend analyses in this study. Second, as discussed in the previous section, there is no variable from which to judge curfew enforcement. Some cities may have enacted a curfew but may not have enforced it. Third, there was no variable asking all

participants about what time of day they consumed alcohol. Therefore, youth may not have decreased their drinking but may have instead just switched their drinking from during curfew hours to before curfew hours, which would show up as no effect. Fourth, this study included all individuals sampled by MTF younger than age 17 years. Although younger individuals consume less alcohol, those ages 12 years or younger only make up .8% of the sample, so it is doubtful that their lower consumption rates increased the likelihood of finding no effect. Fifth, there may be important state-level factors that would have affected the results if they had not been omitted from the models.

In addition, the MTF survey itself has some limitations. Although the survey has high response rates, it does acknowledge that students absent from class on the day that the survey was given were excluded from the study. Moreover, “students with higher absentee rates tend to have higher-than-average rates of drug use ([Kandel, 1975](#); [Bachman, Johnston, et al., 1981](#)), so missing them is likely to have some effect on drug use estimates” ([Bachman et al., 2011](#), p. 40). However, MTF investigators concluded that adjusted drug use estimates that have been corrected for absenteeism only slightly differ from unadjusted drug use rates.

MTF surveyed a nationally representative sample that may or may not be representative at a more local level. The MTF sample was designed to be representative of the country as a whole, but not for any sub-unit (i.e., not states or cities). This makes it harder to use it to draw conclusions at the city level, which is what is necessary here, as it is the cities that are enacting the curfew laws.

Another limitation is that the MTF zip codes were for respondents’ schools and not residences. Only 37% of respondents both were asked for and provided a readable residential zip code. Of these, 55% had residential zip codes that matched their school zip codes. However, it is not unreasonable to assume that given the requirement of public schools that most children live within the jurisdiction of the school, even students whose residential zip codes do not match those of the school would still live within the same city and thus still be covered by the curfew laws.

The MTF data on alcohol consumption were not coded in an easily understandable manner. For example, youth do not answer how many times they have consumed alcohol in the past 30 days, but rather make choices between selections such as whether they have had alcohol 0, 1–2, 3–5, 6–9, . . . or 40 plus times. Perhaps if it were coded as a linear variable, the effect of increasing one’s alcohol consumption by one drink could be studied rather than just looking at whether someone has consumed alcohol at all versus not.

Last, potential endogeneity and time-varying co-variable problems exist. Endogeneity means that there may be unaccounted-for relations between variables. As a result, there may be omitted variable bias if one or more important causal factors were omitted. The issue of time-varying co-variable problems arises because a fixed-effects model takes care of city factors that are fixed over time but not those that change over time. For example, the models did not account for a city that may have lost a significant amount of money one year and therefore had to lay off part of its police force and thus change its policing policy.

## Future research

It would be difficult to conduct another study—especially a difference-in-difference analysis of pre- and post-curfew enactment—using national data, as most of the cities used in this study enacted curfew laws by the mid-1990s and most current data sets of underage alcohol consumption do not have data from that time. Even so, there are still several interesting directions for future research. One possibility is to research cities that have enacted curfew laws since 2005 and then to use the same regressions from this study with current MTF data. A future study should also include a measure of enforcement (e.g., coded interviews with police officers or other city officials or data on citations or arrests of youth violating curfew laws). We suggest that future researchers explore the utility of case studies to examine factors related to enforcement. A researcher could also match cities with and without curfew laws based on demographics and other similarities, thus reducing the amount of unaccounted-for variation that might skew the results. Last, future studies could examine the effect of enacting juvenile curfew laws on the consequences of underage alcohol consumption by looking at rates of driving

accidents, fatalities, or emergency medical services (e.g. ambulance or paramedic services) caused by underage alcohol consumption.

## Conclusions

Overall, few studies have looked at the impact of juvenile curfew laws on adolescent behaviors and resulting negative outcomes. To our knowledge, this is the first study to look at the impact of such laws on underage alcohol consumption. Although the effect of curfew law enactment on youth drinking was not significant in most cases, it is unclear whether curfew laws really have no effect on underage alcohol consumption without more knowledge as to where and when youth are drinking both before and after the enactment of curfew laws and how these laws are being enforced. Future research can answer the question as to whether curfew laws have effects on the consequences of underage alcohol consumption such as drunk driving.

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